

CLAIMS

1. (Newly Amended) A method of producing nitride based heterostructure devices comprising the steps of:

providing a substrate; and

cont applying a ternary layer on the substrate, wherein the ternary layer includes Ga, In, and N;

and

applying a quaternary layer ~~over the substrate~~ on the ternary layer, wherein the quaternary layer includes Ga, Al, N, and In.

2. (Original) The method of claim 1, wherein the substrate comprises one of the group comprising sapphire, SiC, ZnO, a spinel substrate, Si, anodized alumina, and AlN.

3-6 (Deleted)

7. (Newly Amended) The method of claim ~~6~~ 1, wherein the quaternary layer includes about a 20% to 30% molar fraction of Al.

8. (Original) The method of claim 7, wherein the quaternary layer further includes about a 2% to 5% molar fraction of In.

9. (Newly Amended) A method of producing nitride based heterostructure devices comprising the steps of:

providing a substrate;

applying a buffer layer on the substrate;

applying a first layer including GaN over on the ~~substrate~~ buffer layer;

applying a ~~ternary~~ second layer over on the first layer, wherein the ~~ternary~~ second layer includes ~~a compound selected from the group comprising AlGaN and InGaN;~~ and

applying a quaternary layer over on the ~~ternary~~ second layer, wherein the quaternary layer includes AlInGaN.

10. (Original) The method of claim 9, wherein the substrate includes one of the group comprising sapphire, SiC, ZnO, a spinel substrate, Si, anodized alumina, and AlN.


11. (Original) The method of claim 9, wherein the quaternary layer includes about a 20% to about 30% molar fraction of Al.

12. (Original) The method of claim 11, wherein the quaternary layer further includes about a 2% to about 5% molar fraction of In.

Claims 13-19 (Deleted)

20. (New) The method of claim 9, wherein the second layer further includes In.

21. (New) The method of claim 20, wherein the buffer layer and the first layer further include In.

 22. (New) A method of producing nitride based heterostructure devices comprising the steps of:

providing a substrate;

providing a buffer layer on the substrate;

applying a ternary layer on the buffer layer, wherein the ternary layer includes Ga, In, and N; and

applying a quaternary layer on the ternary layer, wherein the quaternary layer includes Ga, Al, In, and N.

23. (New) The method of claim 22, wherein the buffer layer includes Al and N.

24. (New) The method of claim 23, wherein the buffer layer further includes In.
